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09/268,948	03/16/1999	MIGAKU TAKAHASHI		9187

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EXAMINER

CANTELMO, GREGG

ART UNIT PAPER NUMBER

1745

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 30

Application Number: 09/268,948

Filing Date: \*\*\*

Appellant(s): TAKAHASHI

\_\_\_\_\_  
Jeffrey T. Knapp  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed July 21, 2003.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

**(4) *Status of Amendments After Final***

No amendment after final has been filed.

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) *Summary of Invention***

The summary of invention contained in the brief is correct.

**(6) *Issues***

The appellant's statement of the issues in the brief is correct.

**(7) *Grouping of Claims***

Appellant's brief includes a statement that claims 1, 10 and 12 stand or fall together.

**(8) *Claims Appealed***

A substantially correct copy of appealed claim 10 appears on page 1 of the Appendix to the appellant's brief. The minor errors are as follows: the Appendix erroneously indicates that claim 10 is dependent upon claim 4. The instant application

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status of pending claim 10 is dependent upon claim 1 (see the preliminary amendment of paper No. 2).

**(9) *Prior Art of Record***

Takahashi, M. "Synthesis of Fe<sub>16</sub>N<sub>2</sub> films by using reactive plasma", IEEE Transactions on Magnetics, vol29, Issue 6 (November 1993), pp 3040-3045

**(10) *Grounds of Rejection***

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Takahashi 1993, of record and for the reasons of record.

Therein Takahashi 1993 discloses forming Fe-N onto a MgO substrate films using a facing (otherwise understood as opposing) target type DC sputtering apparatus (page 3040, second column and page 3041 first column). The process is performed under identical plasma conditions  $T_e$  is within a range of about 0.2 eV and 0.6 eV and  $N_e$  is about  $10^9 \text{ cm}^{-3}$ . The result was an Fe-N sputtered film wherein only diffracted line of (002) from  $\alpha'$  is observed (page 3041, second column).

According to the instant application, the martensite  $\alpha'$  (002) is abbreviated to  $\alpha$  (002). Therefore recitation of the term  $\alpha$  (002) in the claim is read in light of the specification to represent a martensite  $\alpha'$  (002) at the surface of the film (see page 8, lines 1-5). Thus whether the claims recite  $\alpha'$  (002) or  $\alpha$  (002) they are shown by the specification to be the same. Thus the  $\alpha'$  (002) having  $\alpha$  (002) formed at the surface, in light of the teachings of the instant specification that  $\alpha'$  (002) is abbreviated to  $\alpha$  (002) teaches that the  $\alpha$  (002) is in fact  $\alpha'$  (002).

Figs. 1 and 4 show sputtering in a nitrogen flow rate of 25%. Since the opposed DC sputtering is performed under the same plasma conditions and was performed in a nitrogen flow rate of 25% the film formed will inherently have the same properties, including permitting diffraction rays from a  $\gamma'$  phase to be observed. The structure of the film will be an  $\alpha''$ -Fe<sub>16</sub>N<sub>2</sub> single phase (page 3041, column 1 as applied to instant claims 1 and 10).

The iron nitride film is formed on an iron underlayer on the substrate (page 3041, first column, paragraph beginning with "[prior to the fabrication]", as applied to claim 12).

**(11) Response to Argument**

**Issue I      Appellant argues that Takahashi et al. does not disclose or suggest the general co-existence of the  $\alpha'$  and  $\gamma'$  phases.**

The Examiner respectfully disagrees. Throughout the disclosure of Takahashi, the prior art of record appreciates the various phases of the iron nitride films, including both the  $\alpha'$  phase and  $\gamma'$  phase. Further, and as acknowledged by Appellant on page 4 of the Appeal Brief, one of ordinary skill in the art would expect the  $\alpha'$  and  $\gamma'$  phases to coexist at around 250° C within the thin films disclosed by Takahashi et al. (see Fig. 3b).

Thus Takahashi et al. is held to clearly teach of a coexistence of  $\alpha'$  and  $\gamma'$  phases, at least for temperatures about 250° C.

Furthermore, the process conditions for fabricating the prior art product are identical to those conditions disclosed in the instant application and as set forth in the rejection above, there is a reasonable expectation that forming the film under the same process conditions will inherently generate the same product having the same claimed properties.

The process conditions for sputtering the iron nitride in the instant application and Takahashi 1993 reference are identical. Therefore it is expected that the prior art iron nitride film of Takahashi will inherently have co-existence of the  $\alpha'$  and  $\gamma'$  phases.

In relying upon the theory of inherency, the examiner has provided a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

"[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical

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processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

Applicant's arguments are not persuasive since they fail to establish clear evidence that the prior art, which appears to form the same film under the same process conditions does not inherently exhibit co-existence of the  $\alpha'$  and  $\gamma'$  phases.

Rebuttals of Appellants arguments that the process conditions are not identical are addressed below.

**Issue II      Appellant argues that Takahashi et al. does not the same process conditions for forming the product and thus cannot anticipate the claimed invention.**

The Examiner respectfully disagrees.

Appellant first states that in a preliminary step to forming an iron nitride film, Takahashi forms an iron underlayer by EB evaporation or sputtering in an argon plasma. Applicant then states that the instant application forms the iron underlayer in an argon atmosphere.

The difference that Appellant asserts is that the instant application forms the iron underlayer in an atmosphere which is inert and not a highly charged argon plasma.

A careful review of the instant application reveals that Appellant has failed to fully appreciate the entire process for manufacturing the underlayer. In particular, the Examiner brings to attention the disclosure on page 7 of the instant application, at lines 3-10.

This disclosure pertains to the formation of the underlayer formed in the presence of argon. The deposition rate and atmosphere for fabricating the underlayer are the same. Appellant appears to have overlooked the fact that the atmosphere is analyzed on the basis of **plasma diagnostic result** (page 7, line 10). Thus contrary to Appellants position, the instant application in fact forms the underlayer film in a plasma environment.

Appellant further argues that the electron density of Takahashi (about  $10^9 \text{ cm}^{-3}$ ) is different than a *preferable range of upwards of  $10^{10} \text{ cm}^{-3}$* .

The Examiner argues that Appellant has not fully considered the full disclosure of the instant application process conditions. Direction is drawn to page 4, lines 6-9 of the instant application wherein the electron density of the instant application is **within a range** of  $1 \times 10^9 \text{ cm}^{-3}$  -  $1 \times 10^{10} \text{ cm}^{-3}$ . Thus the product of claims 1, 10 and 12 can be achieved for electron density levels within this range, and the lower end of this electron density range being taught by Takahashi et al.

Thus the prior art process conditions are held to be the same as the instant application, contrary to Appellant's position.

In closing Appellant uses terms such as "the process parameters used ... are not necessarily the same", that the differences in the process parameters "*can be*" significant. While the Examiner has considered Appellants statements therein, these responses are held only as Appellants beliefs and opinions since they are presented without evidence.

For the above reasons, it is believed that the rejections should be sustained.



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Respectfully submitted,

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gc

August 12, 2003

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